

# Distinguished Lecture 2011

February 24, 2011- ISyE Atrium

Reception at 4:00 p.m. ; Lecture at 4:30 p.m.

## Service Engineering: Data-Based Science in Support of Service Management, or Empirical Adventures in Call Centers and Hospitals

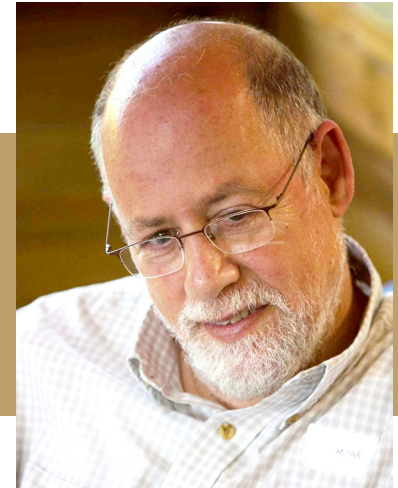
In this lecture, Dr. Mandelbaum will describe examples of complex service operations for which data-based simple models have been found useful, which he refers to as "Simple Models at the Service of Complex Realities." Examples include call centers, hospitals, banks, courts and more. He views these service systems through the mathematical lenses of Queueing Science, with a bias towards Statistics.

The mathematical framework for his models is asymptotic queueing theory, where limits are taken as the number of servers increases indefinitely, in ways that maintain a sought-after (often delicate) balance between staffing level and offered-load. A specific such balance reveals an operational regime that achieves, under already moderate scale, remarkably high levels of both service quality and efficiency. This is the QED regime (Quality- & Efficiency-Driven), discovered by Erlang and substantiated mathematically by Halfin & Whitt.

The data-source for the lecture is a unique data repository from call centers and hospitals. The data is maintained at the Technion's SEE Laboratory (Service Enterprise Engineering). It is unique in that it is transaction-based; it details the individual operational history of all the service transactions (e.g., calls in a call center or patients in an emergency department). One source of data, publicly available, is a network of four call centers of a U.S. bank, spanning two and a half years and covering about 1,000 agents; there are 218,047,488 telephone calls overall, out of which 41,646,142 were served by agents, while the rest were handled by answering machines. The data can be explored via SEESat, an environment for online Exploratory Data Analysis. SEESat is accessible after registration at <http://seeserver.iem.technion.ac.il/see-terminal/>.

## Avishai "Avi" Mandelbaum

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### General Information

Avi Mandelbaum has a B.Sc. in Mathematics and Computer Science and an M.A. in Statistics, both summa cum laude, from Tel-Aviv University. His Ph.D. is in Operations Research from Cornell University. After graduation, in 1983, he joined the Graduate School of Business at Stanford University. He left the U.S. in 1991 to assume a position at the Technion on the faculty of Industrial Engineering and Management (IE&M). This faculty, as well as his current interests, constitutes a convex hull of all the areas with which he has been involved.

At the Technion, Dr. Mandelbaum has been teaching courses in probability, stochastic processes and service engineering. In IE&M, he served as the coordinator of IE&M graduate studies and was the associate dean for research; he is a past member of the Technion Academic Development Committee and the Prize committee of the Applied Probability Society. Since 1995, he has been the faculty advisor for IE&M outstanding students.

Dr. Mandelbaum's teaching has been acknowledged by the Technion Mani Award for Excellence in Teaching, 1999; the Technion Excellence in Teaching Award, 2000 (for the course, Service Engineering); and the inaugural Meir Rosenblatt Prize for teaching, 2004. His research contributions have been acknowledged by the ORSIS Yosef Levy prize, 2001; the Mitchner Prize for Quality Sciences and Quality Management, 2003; and the inaugural Markov Lecture of the Applied Probability Society, INFORM, 2005.

For more information about Dr. Mandelbaum, visit his homepage <http://iew3.technion.ac.il/Home/Users/avim.phtml> or the website of his Service Engineering course <http://ie.technion.ac.il/serveng>.